

### AMENDMENTS TO THE CLAIMS

1.-17. Canceled.

18. (Currently amended) The method according to claim ~~16~~ 33, further comprising the steps of:

updating at least one of said topological representation, said first position and said second position, according to an organ timing signal of an organ timing monitor coupled with a monitored organ of said body, said monitored organ being coupled with said lumen system; and  
controlling said moving mechanism according to at least one of said updated topological representation, said updated first position and said updated second position.

19.-25. Canceled.

26. (Currently amended) ~~The method according to claim 22,~~ Method for guiding a catheter along a path to a predetermined location within a lumen system of a body of a patient, the method comprising the steps of:

establishing a path in said lumen system from a topological representation of the lumen system;

determining a new first position of said catheter in said path according to a position signal received respective of the first position of a distal portion of said catheter and also determining a new position to which said catheter is to be moved based on said determined first position and according to said path established from said topological representation;

operating a moving mechanism to move said catheter to a second position, according to said new determined position;

receiving said position signal as said catheter is moved during said operating step and when said second position is substantially identical with said new determined position determining a further new position on said path to which said catheter is to be moved and when said second position is not identical with said new determined position determining at least one corrective movement for said catheter;

directing said moving mechanism to move said catheter according to said determined corrective movement;

updating at least one of said topological representation, said first position and said second position, according to an organ timing signal of an organ timing monitor coupled with a monitored organ of said body said monitored organ being coupled with said lumen system;

controlling said moving mechanism according to at least one of said updated topological representation, said updated first position and said updated second position;

superposing a representation of at least one of said updated first position and said updated second position on an image of at least a portion of said lumen system; and

displaying said superposition wherein said displaying steps includes transforming a three-dimensional coordinate system of a medical positioning system for determining at least one of said first position and said second position, to a two-dimensional coordinate system of said image.

27. (Currently amended) The method according to claim 16 33, wherein said topological representation is produced by indicating an origin and a destination on an image of at least a portion of said lumen, in a coordinate system respective of said body.

28. Canceled.

29. (Currently amended) The method according to claim 16 33, further comprising imaging at least a portion of said lumen system at at least one image plane which is closest to said predetermined path, among a plurality of other image planes.

30. (Currently amended) The method according to claim 16 33, further comprising imaging at least a portion of said lumen system at at least one other image plane, when in at least one prior image plane, at least a portion of at least one lumen system overlaps said lumen system.

31. (Currently amended) The method according to claim 16 33, further comprising determining the shape of said distal portion, according to a plurality of position signals received

respective of positions of a plurality of position detectors located at said distal portion, after performing said procedure of operating.

32. (Currently amended) The method according to claim 16 ~~33~~, wherein said at least one corrective movement is selected from the list consisting of:

along a longitudinal axis of said catheter relative to at least a portion of said lumen; and  
about said longitudinal axis relative to said at least one portion.

33. (Currently amended) ~~The method according to claim 16, Method for guiding a catheter along a path to a predetermined location within a lumen system of a body of a patient, the method comprising the steps of:~~

establishing a path in said lumen system from a topological representation of the lumen system;

determining a new first position of said catheter in said path according to a position signal received respective of the first position of a distal portion of said catheter and also determining a new position to which said catheter is to be moved based on said determined first position and according to said path established from said topological representation;

operating a moving mechanism to move said catheter to a second position, according to said new determined position;

receiving said position signal as said catheter is moved during said operating step and when said second position is substantially identical with said new determined position determining a further new position on said path to which said catheter is to be moved and when said second position is not identical with said new determined position determining at least one corrective movement for said catheter; wherein said at least one corrective movement is determined, when the orientation of said distal portion at a certain location within said lumen system, is different than at least one slope of said three-dimensional path at said certain location; and

directing said moving mechanism to move said catheter according to said determined corrective movement.

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34. Canceled.